



The bones of three young dinosaurs are preserved in this block of stone.

PALAEONTOLOGY

Roosting dinosaurs are a fossil first

Trio of bird-like animals may have been snuggling for warmth when they died 70 million years ago.

BY TRACI WATSON

The fossilized remains of three young dinosaurs who seem to have been snuggled together in sleep have been found in a stone block that poachers hacked out of the Mongolian desert.

Researchers say the 70-million-year-old specimens are the first known example of dinosaurs sleeping in a group, a behaviour called communal roosting. Many modern species, including crows and bats, engage in the practice, which helps animals to regulate their body temperature and avoid predators.

The three dozing dinosaurs were probably relatives and possibly siblings, says Greg Funston, a vertebrate palaeontologist at the University of Alberta in Canada who led the team that analysed the fossils. The trio “clearly had a quite close bond”, Funston says. “They were living together at the time of death.” He described the fossils on 25 August at the annual meeting of the Society of Vertebrate Paleontology in Calgary, Canada.

Mongolian customs agents seized the block of fossils at an airport in 2006. A geochemical

analysis suggests that the dinosaurs probably came from the Bugiin Tsav fossil site in the Gobi desert. Federico Fanti, a vertebrate palaeontologist at the University of Bologna in Italy who led the geochemical study, presented the data on 24 August, at the same palaeontology meeting.

Funston’s team identified the fossils as a new species of oviraptorid — a group of dinosaurs with short faces, long necks and toothless beaks that lived during the Cretaceous period, 145 million to 65 million years ago. The species, which has not yet been formally named, has a domed crest on its head, like that of a modern-day cassowary, and walked on two legs.

Unlike most dinosaur fossils, two of the animals in the block — those whose skeletons are most complete — are crouched belly down. Their necks are curled back towards their bodies, while their forelimbs cradle their heads. The pose is similar to that of ostriches and emus in deep sleep, Funston says.

“They were alive together and they perished together.”

A handful of previously discovered fossils capture napping dinosaurs, but all show a lone animal. The new fossil suggests that communal roosting developed in animals with rich social lives, Funston says. Oviraptorids fit the bill: they browsed for food in groups and probably flashed their crests at rivals or potential mates.

From the width of the thighbones of the two most extensive skeletons in the block, the researchers estimate that each animal weighed roughly 45 kilograms, a little more than a German shepherd dog. The third skeleton is too fragmented for the researchers to estimate its weight. But it is roughly the same size as its companions, suggesting that the three were close in age.

Two additional Mongolian fossils of the same species help to bracket the age of the sleeping trio. A previously discovered adult from a different bone bed weighed 75 kilograms. Another specimen recovered from poachers in 2006 was 33 kilograms and, judging by its bone development, was probably less than one year old. That led the team to estimate that the animals in the block were 2–5 years old — making them the equivalent of “teenagers hanging out in the parking lot”, says David Varricchio, a vertebrate palaeontologist at Montana State University in Bozeman.

The configuration of the three animals implies that they were touching each other, and Funston’s team thinks the youngsters were probably huddling for warmth. That suggests that the animals had tried to maintain a constant body temperature, Funston says, even though most animals that huddle for warmth are small. He speculates that frigid weather or a sand storm drove the three dinosaurs to nestle together.

Other researchers have reservations about that idea. The animals may have huddled together to hide or merely because the spot was “a great place to sleep”, says John Grady, a biologist at Bryn Mawr College in Pennsylvania who has studied the metabolic rates of dinosaurs. And Varricchio wonders whether the young reptiles were resting or taking shelter from harsh conditions rather than sleeping.

But Funston argues that modern animals that roost together don’t usually make direct contact except for warmth. Animals that died in events such as floods are preserved in very different stances from that of the oviraptorid trio, he says, making it unlikely that the dinosaurs were awake.

Whatever the three fossilized dinosaurs were doing, researchers say that their remains suggest that young oviraptorids were social animals. There is fossil evidence of adult oviraptorids sitting on nests, and Varricchio says it makes sense that the young “should be palling around” rather than getting in the adults’ way. The life-like pose of the fossils in the block, he says, shows “they were alive together and they perished together”. ■